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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/019,902	07/02/2002	Nikolai Vladimirovich Bovin	9286-7	7167
20792 7590 04/04/2007 MYERS BIGEL SIBLEY & SAJOVEC PO BOX 37428 RALEIGH, NC 27627			EXAMINER MAIER, LEIGH C	
			ART UNIT	PAPER NUMBER
			1623	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		04/04/2007	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 10/019,902	Applicant(s) BOVIN ET AL.	
	Examiner Leigh C. Maier	Art Unit 1623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 January 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6,9-12,14-16,18,20,23,27 and 28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 9 is/are allowed.
- 6) ☒ Claim(s) 1-6,10-12,14-16,18,20,23,27 and 28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of the Claims

Claims 1, 3, 6, 9, 10, 12, 15, 18, 23, 27 and 28 have been amended. Claims 1-6, 9-12, 14-16, 18, 20, 23, 27 and 28 are pending. Any rejection or objection not specifically repeated has been withdrawn. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Applicant asserts the entitlement to the consideration of additional species with respect to variable "R" and variable "X" upon allowance of the species wherein "R" is a saccharide, and "X" is carbon. This is noted. Please see discussion below.

Claim Rejections - 35 USC § 102

Claims 1-5, 10-12, 14-16, 23, 27 and 28 are rejected under 35 U.S.C. 102(b) as being anticipated by Unverzagt et al (Carbohydr. Res., 1994).

Applicant's arguments filed January 5, 2007 have been fully considered but they are not persuasive.

Applicant contends that the amended claims require trivalent and tetravalent peptides, and Unverzagt fails to teach such products. The examiner maintains that the Unverzagt products meet the requirements of the claims as amended. Please see the CAS abstract of Unverzagt depicting compound 3c. On the 2nd page of the abstract, a methylene group is marked with an arrow. This carbon atom corresponds to "X" in formula (I). It has four K-R groups attached. Two of these K-R sequences are "bond-H." The other two are $A^1-(A^2-A^3)_k\text{-sp-R}$. The claim requires

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that “at least one R is not hydrogen” and “there are at least two K that are not a bond.” Two Rs are not hydrogen and at least two Ks are not a bond.

Claim Rejections - 35 USC § 103

Claims 1-5, 10-12, 14-16, 18, 20, 23, 27 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Unverzagt et al (Carbohydr. Res., 1994).

Applicant's arguments filed January 5, 2007 have been fully considered but they are not persuasive. The argument is limited to Applicant's view that Unverzagt does not teach the compounds recited in the claims as amended. This is addressed above.

Claims 1-5, 10-12, 14-16, 18, 20, 23, 27 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Unverzagt et al (Carbohydr. Res., 1994) in view of Mammen et al (Angew. Chem. Int. Ed., 1998).

Applicant's arguments filed January 5, 2007 have been fully considered but they are not persuasive. As above, Applicant argues that that Unverzagt does not teach the compounds recited in the claims as amended. This is addressed above.

Applicant further argues that Mammen has several drawbacks regarding therapeutic use in that the reference teaches the use of polyacrylamides, which produce potentially toxic metabolites. However, as was clear from the previous Office action, Mammen was not used to suggest the administration of polyacrylamide-based conjugates. It was used for the teaching that multivalent ligands are used advantageously for the treatment of a number of diseases.

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Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Watowich et al (Structure, 1994).

As noted above, claim 6 has been searched with respect to the first subgenus wherein $X=C$, and this subgenus is found to be enabled and free of the art. The next subgenus selected is $X=C_6H_{6-m}$.

Watowich teaches a bivalent sialoside having two "K-R" moieties meeting the structural limitations of said moieties. See Figure 1d. See also the structure as depicted in the CAS to more clearly see how this structure meets the definition of "K-R." The reference is drawn to the design of high-affinity receptor analogs of influenza virus hemagglutinin. The reference notes that the 100-fold increase in binding affinity of the bivalent compound over NeuAc2Me is "probably due to a chelating effect resulting from the bivalent G(4,4)NeuAc ligand interacting with two hemagglutinin molecules on the viral surface." See paragraph bridging pp 726-727. The reference further suggests the preparation of a trivalent compound similar to G(4,4)NeuAc having a common attachment group, such as benzyl. Such a compound would optimally have at least seven residues in the polypeptide aglycon linker. See page 727 at the last full paragraph.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to prepare a trivalent sialoside having a C_6H_{6-m} core with oligo/poly-gly linker to achieve the increased hemagglutinin affinity as suggested in the reference. One of ordinary skill would have a reasonable expectation of success in preparing such a compound as a therapeutic, high affinity inhibitor of viral attachment.

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Allowable Subject Matter

Claim 9 is allowed. Claim 6 would be allowed if limited to X=C.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

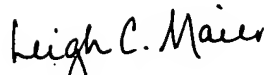
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Examiner's hours, phone & fax numbers

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leigh Maier whose telephone number is (571) 272-0656. The examiner can normally be reached on Monday, Wednesday and Thursday 7:00 to 3:30 (ET).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ms. Anna Jiang at (571) 272-0627, may be contacted. The fax number for Group 1600, Art Unit 1623 is (703) 872-9306.

Visit the U.S. PTO's site on the World Wide Web at <http://www.uspto.gov>. This site contains lots of valuable information including the latest PTO fees, downloadable forms, basic search capabilities and much more. Information regarding the status of an application may be obtained from the Patent Application Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished application is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197.



Leigh C. Maier
Primary Examiner
March 29, 2007